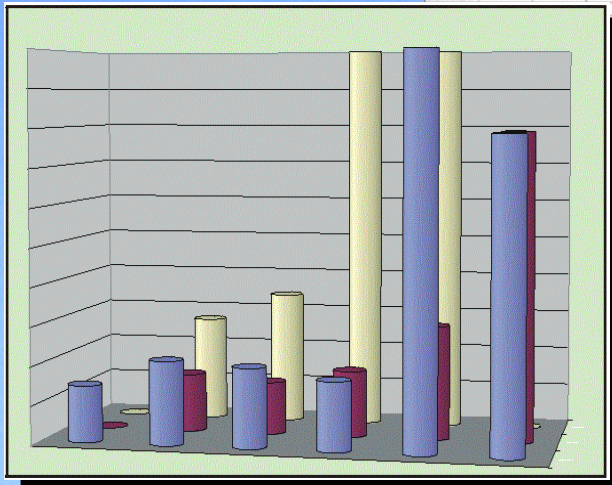


# Hawaii Department of Health

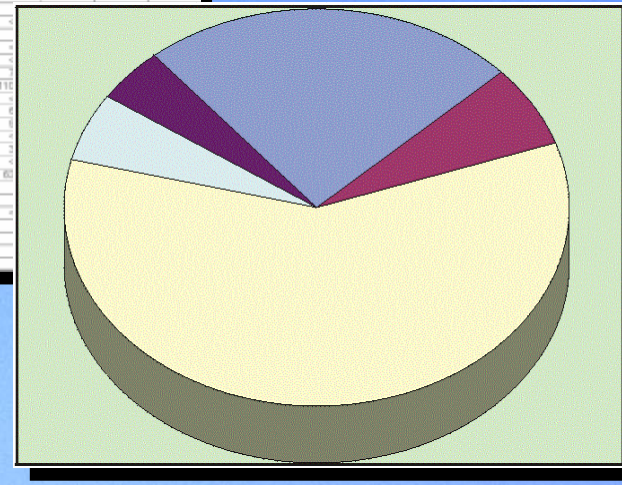
## Indicators of Environmental Quality

September 1999

PRIORITY POLLUTANTS									
POLLUTANT		1st/99	4th/95	3rd/96	2nd/95	1st/95	sludge ug/kg 1997d	sludge ug/kg 1997c	sludge ug/kg 1997b
2,3,7,8-TCDD	pg/L	<2.6	<3.8	<3.7	<3.4	<2.5	<0.01 ppb	<0.02 ppb	<0.01 ppb
asbestos	ug/L								
amphibole									



400	400	400	400	400
100	<1500	<1500	<1500	<1500
<3	<3	<3	<3	<3
<80	<80	<80	<80	<80
<10	<10	<10	<10	<10
44	44	30	<20	116
<10	<10	<10	<10	<10
150	<150	<220	220	<150
40	<40	40	66	44
800	<800	<800	<500	<500
<10	<10	<10	<20	<20
500	<1500	<1500	<1500	<1500
30	30	30	30	29
0.2	<0.2	<0.2	<2	<0.2
48	0.12	<0.5	0.22	<0.48
48	<0.48	<0.5	<0.5	<0.48
48	<0.48	<0.5	<0.5	<0.48
48	<0.48	<0.5	<0.5	<0.48
0.1	1.1	2.2	1.9	2.9
48	<0.48	<0.5	<0.5	<0.48



## Document Notes

This report includes a selection of 18 environmental indicators, each occupying a single page. Each indicator page shows a small data set, a chart based on those data, and a discussion of the indicator and the data upon which it is based. Only data collected by, through or about HDOH programs are included in these indicators.

- ❑ The discussion accompanying each indicator is separated into five sections:

- ◆ *Explanation:* The first section explains the data and chart, focusing on the fundamental picture portrayed by the chart. Terms and caveats are also discussed in this section.
- ◆ *Implications:* An 'Implications' section follows, with a short, and sometimes subjective discussion of what impact the indicator analysis may have on public health and the environment, and therefore on HDOH's environmental programs.
- ◆ *Data Quality:* The third section provides a one-word assessment of data quality for the indicator. Data quality is ranked as either High (±5-10% confidence), Medium (±10-25% confidence), or Low (±25-50% confidence).
- ◆ The last two discussion sections note the *Source* of the data and comment on whether the *Data are required of HDOH by EPA*.

- ❑ In most cases, where a percentage scale is used in a chart, the scale ranges from 0% to 100% percent. Some charts start at a low of 50% or 75% and extend up to 100% in order to more clearly show trends.

- ❑ Data used are organized on a federal fiscal year (FFY) calendar (unless otherwise noted), and usually cover the years 1994 through 1998 in order to obtain a five-year trend for each indicator. Some indicators do not have data available for that period, one has additional data listed, and some provide only 'snapshot' information.
- ❑ The term "no data" is listed in spreadsheets to indicate missing data. Those data were not made available in time to be included in this report. In a few instances, the data may not exist.

**Environmental Indicator:** a tool which uses best available data to measure the quality of the environment and/or progress made in protecting the environment.

## Acronyms

EPA	- Environmental Protection Agency
EPO	- Environmental Planning Office
CAB	- Clean Air Branch
CWB	- Clean Water Branch
HDOH	- Hawaii Department of Health
NRIAQB	- Noise, Radiation & Indoor Air Quality Branch
OSWM	- Office of Solid Waste Management
SDWB	- Safe Drinking Water Branch
SHWB	- Solid and Hazardous Waste Branch
WWB	- Wastewater Branch

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Hawaii Department of Health  
Environmental Planning Office  
919 Ala Moana Blvd., Suite 312  
Honolulu, HI 96814  
Phone: 808-586-4337

# Multi-Program Indicators

## Toxic Releases into Hawaii's Air, Water and Land

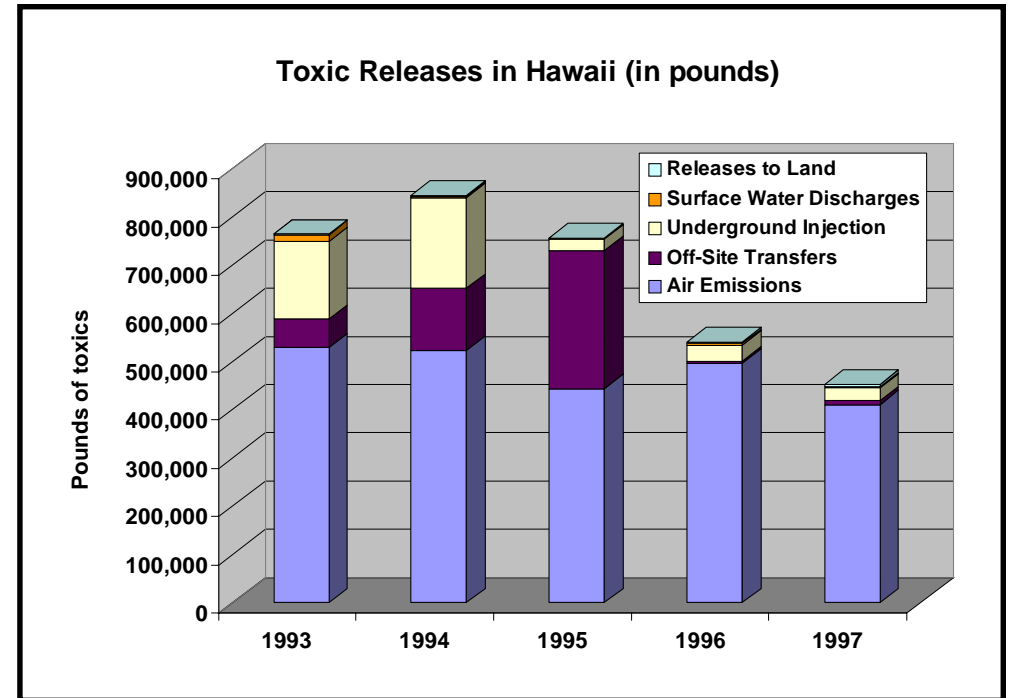
Explanation: Releases of toxic compounds into Hawaii's air, water and land are declining overall. Air emissions have not decreased significantly, but releases to water and injection wells have dropped dramatically, as have off-site transfers.

Implications: Because the air, water and land are not separated environmentally, an overall decrease in releases is promising. Without hindering industrial development, further declines in (legal) releases would be beneficial, though unexpected.

Data Quality: Medium (i.e.,  $\pm 10$ -25% confidence).

Source: EPA's Toxic Release Inventory (available on EPA's Web site).

Data required from HDOH by EPA?: No.



Toxic Release Data (in pounds)					
FFY	Air Emissions	Surface Water Discharges	Underground Injection	Releases to Land	Off-Site Transfers
1993	528,077	14,300	160,015	1,760	59,920
1994	522,810	2,300	188,210	2,505	128,557
1995	443,607	1,510	24,306	545	285,905
1996	496,508	3,265	33,209	3,290	3,995
1997	409,983	2,119	25,750	6,188	8,365

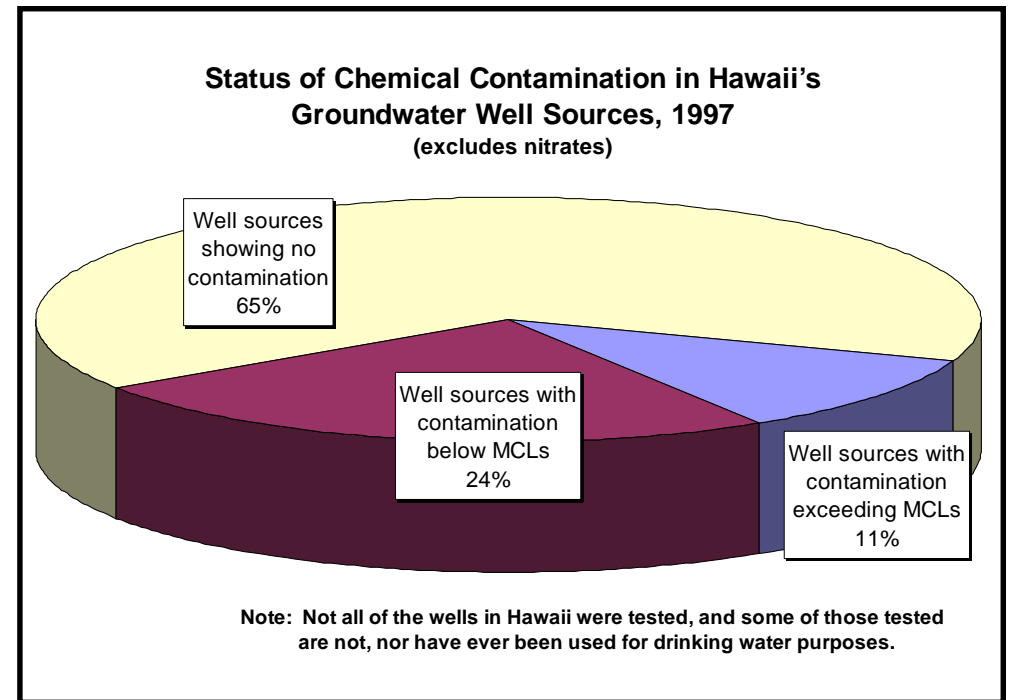


## Status of Chemical Contamination in Hawaii's Groundwater Well Sources as of 1997

**Explanation:** Testing conducted on many of Hawaii's groundwater 'well sources' (i.e., individual wells or groups of wells in one location) indicate that 65% of the well sources are without any detectable chemical contamination (excluding nitrates). Thirty-five percent of the wells tested showed contamination; including 11% of the total which tested at such high levels of certain chemicals that the water is deemed to be unsafe to drink without treatment (i.e., exceeds maximum contaminant levels or MCLs). MCLs as used here also include exceedances for chemicals for which no MCL has been set, but for which there has been an exceedance of a health-based concentration ceiling (e.g., lifetime health advisory, or LHA).

**Implications:** If these data were extrapolated to the entire state, over one-third of Hawaii's aquifers may be assumed to be contaminated with chemicals other than nitrates, and one-tenth or more of our aquifers may be assumed to be contaminated to such a degree that the water is no longer potable without treatment. Contamination is likely to increase in the short-term due to historical applications of pesticides and releases of other chemicals. Previous contaminants may still be percolating down to the groundwater table. Because of this, HDOH will not be able to improve the condition of Hawaii's groundwater aquifers in the short-term. However, HDOH can help prevent future contamination through its various pollution control and remediation programs.

**Data Quality:** Medium (i.e.,  $\pm 10$ -25% confidence).



Groundwater Well Source Contamination Data			
Well Sources Showing No Contamination	Contaminated Well Sources		Total Well Sources
	Contamination Exceeds MCLs	Contamination Below MCLs	
183	30	68	281

**Source:** HDOH's 1997 Groundwater Contamination Maps.

**Data required from HDOH by EPA?:** No.

## Clean Air Branch Indicators

### Ambient Levels of Sulfur Dioxide Compared to National Standards

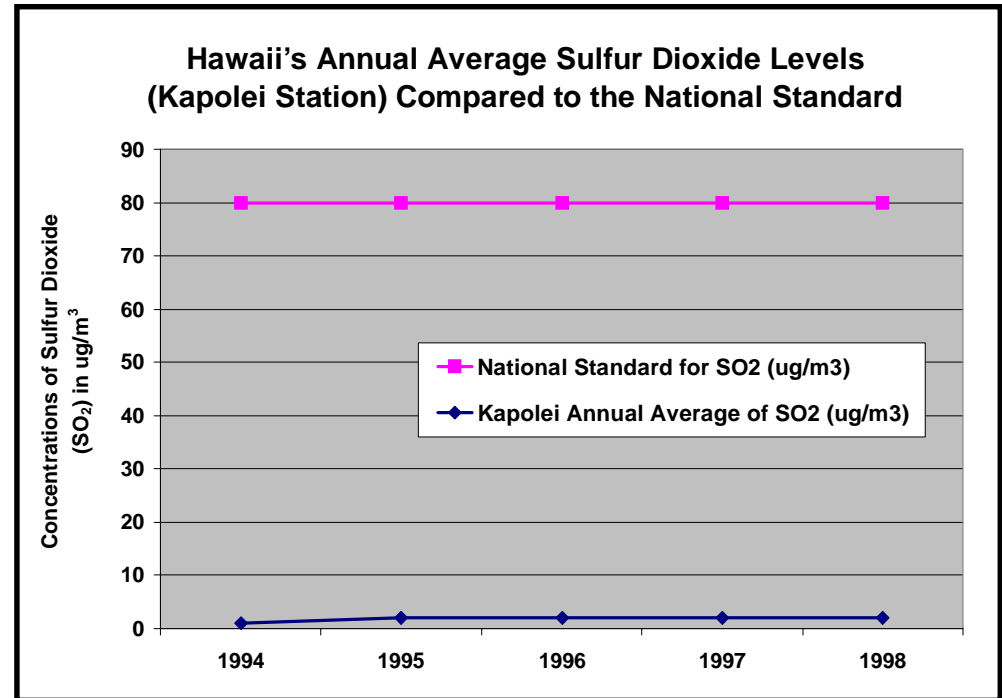
Explanation: The annual average limit set for sulfur dioxide ( $\text{SO}_2$ ) concentrations in ambient air by EPA (i.e., the “national standard”) is 80 micrograms/cubic meter. The results from the Kapolei air monitoring station, adjacent to Campbell Industrial Park and used here to be representative of sulfur dioxide concentrations near a heavy industrial area, show that the annual average has only been 1-2 micrograms/cubic meter ( $\text{ug}/\text{m}^3$ ) over the past five years. This value is roughly 97% below the standard.

Implications: The national standard is set at a level below which is considered safe. Hawaii’s annual average concentrations of sulfur dioxide due to industrial emissions are so low that they do not pose a health concern. Exposure to peak concentrations of sulfur dioxide are not addressed by this measure. Spikes in  $\text{SO}_2$  can affect those with asthmatic conditions. Volcanic emissions of  $\text{SO}_2$  would only be detected if the wind direction blows the volcanic plume towards Oahu. However, those ‘Kona’ winds bring mostly sulfates ( $\text{SO}_4$ ), not  $\text{SO}_2$ , to Oahu. The sulfates are included in the  $\text{PM}_{10}$  particulate category.

Data Quality: High (i.e.,  $\pm 5$ -10% confidence).

Source: HDOH Clean Air Branch.

Data required from HDOH by EPA?: Yes.



Sulfur Dioxide Indicator Data		
FFY	Kapolei Annual Average of $\text{SO}_2$ ( $\text{ug}/\text{m}^3$ )	National Standard for $\text{SO}_2$ ( $\text{ug}/\text{m}^3$ )
1994	1	80
1995	2	80
1996	2	80
1997	2	80
1998	2	80

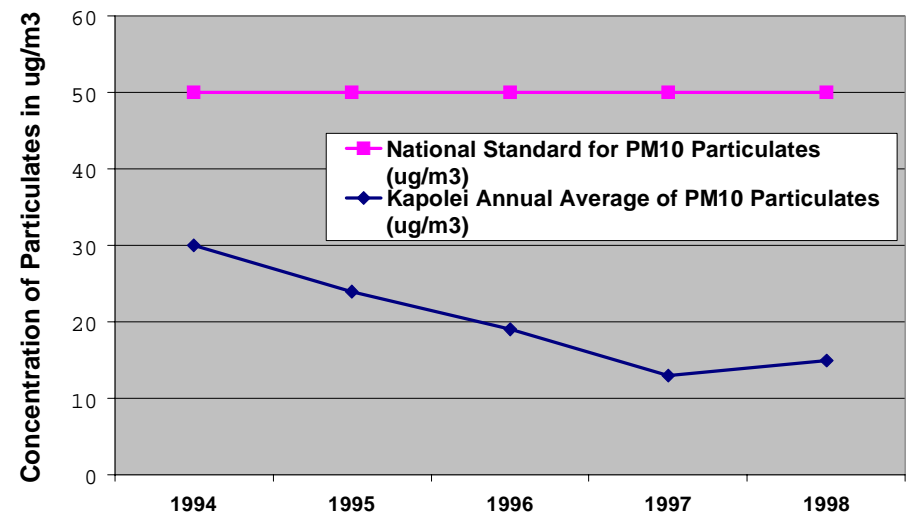
## Ambient Levels of Air-borne Particulates (PM<sub>10</sub>) Compared to National Standards

**Explanation:** The annual average limit set by EPA (i.e., the “national standard”) for concentrations of particulates in ambient air (a.k.a. PM<sub>10</sub>, or particles which range in size up to 10 microns) is 50 micrograms/cubic meter. At the Kapolei monitoring station (which is located in the vicinity of Campbell Industrial Park), the annual average concentration of particulates has declined from 30 ug/m<sup>3</sup> to 15 ug/m<sup>3</sup> since 1994. At 15 ug/m<sup>3</sup>, this annual average is 70% below EPA’s standard. The results from the Kapolei station are used here to represent PM<sub>10</sub> concentrations near a heavy industrial area.

**Implications:** Given that concentrations at Kapolei are far below the national standard, this indicator gives HDOH no reason to be concerned about health effects due to PM<sub>10</sub> concentrations reported on an averaged basis. The visual trend line in the chart shows decreasing concentrations over time, perhaps due to decreases in construction or better dust control. Changing the monitoring equipment in 1997 from manual to continuous sampling may also have impacted the results. Sulfates from volcanic emissions which blow over Oahu on Kona wind days do not cause large increases in concentrations of PM<sub>10</sub>. Like the data for sulfur dioxide, this indicator does not address short-term peaks in concentration. Spikes in PM<sub>10</sub>, however, are less of a health concern than spikes in SO<sub>2</sub> and CO.

**Data Quality:** High (i.e., ±5-10% confidence).

**Hawaii’s Annual Average Particulate Level (Kapolei Station) Compared to the National Standard**



**Air-borne Particulates Data**

FFY	Kapolei Annual Average of PM <sub>10</sub> Particulates (ug/m <sup>3</sup> )	National Standard for PM <sub>10</sub> Particulates (ug/m <sup>3</sup> )
1994	30	50
1995	24	50
1996	19	50
1997	13	50
1998	15	50

**Source:** HDOH Clean Air Branch.

**Data required from HDOH by EPA?:** Yes.

## Ambient Levels of Carbon Monoxide Compared to National Standards

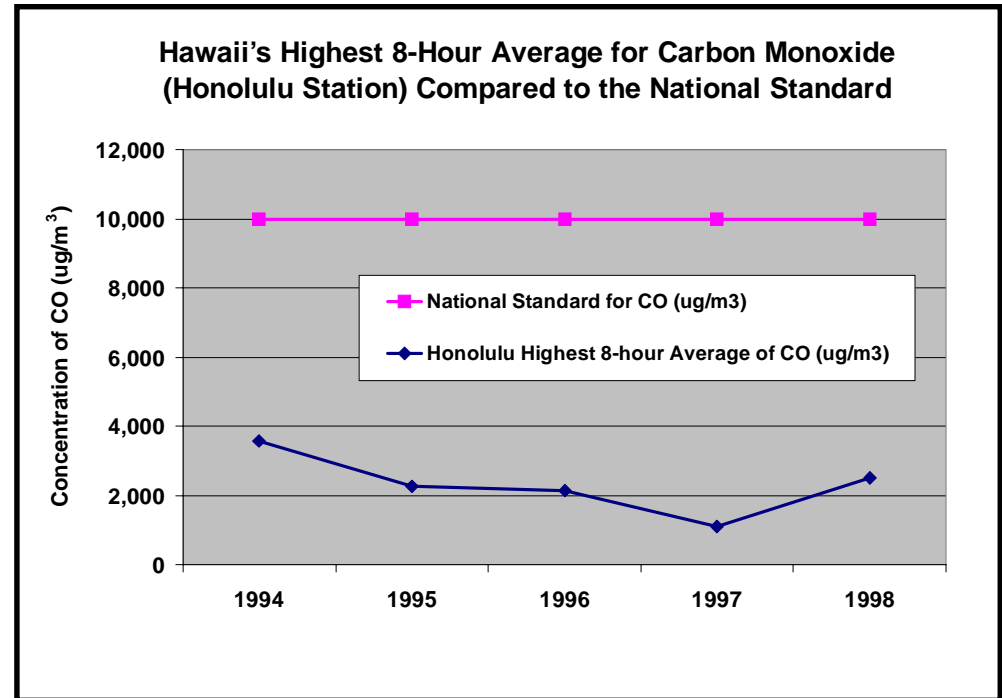
Explanation: The 8-hour average limit set for carbon monoxide concentrations in ambient air by EPA (i.e., the “national standard”) is 10,000 ug/m<sup>3</sup>. At the Honolulu air monitoring station, which is located in an urban environment with heavy automobile traffic, the highest 8-hour average has ranged from roughly 1,100 ug/m<sup>3</sup> to 3,600 ug/m<sup>3</sup> during the past five years. The CO concentration has remained from 64% - 89% lower than the standard during that period.

Implications: Again, the concentrations of this air pollutant are well below the national standard, and give no cause for health concerns. The CO measure shows the 8-hour averages each year rather than annual averages because there is no standard for *annual* average concentrations of carbon monoxide. Spikes in CO concentration are not addressed in this indicator. People with heart conditions could be impacted by highly elevated CO concentrations.

Data Quality: High (i.e.,  $\pm$ 5-10% confidence).

Source: HDOH Clean Air Branch.

Data required from HDOH by EPA?: Yes.



Carbon Monoxide Data		
FFY	Honolulu Highest 8-hour Average of CO (ug/m <sup>3</sup> )	National Standard for CO (ug/m <sup>3</sup> )
1994	3,583	10,000
1995	2,264	10,000
1996	2,127	10,000
1997	1,088	10,000
1998	2,494	10,000

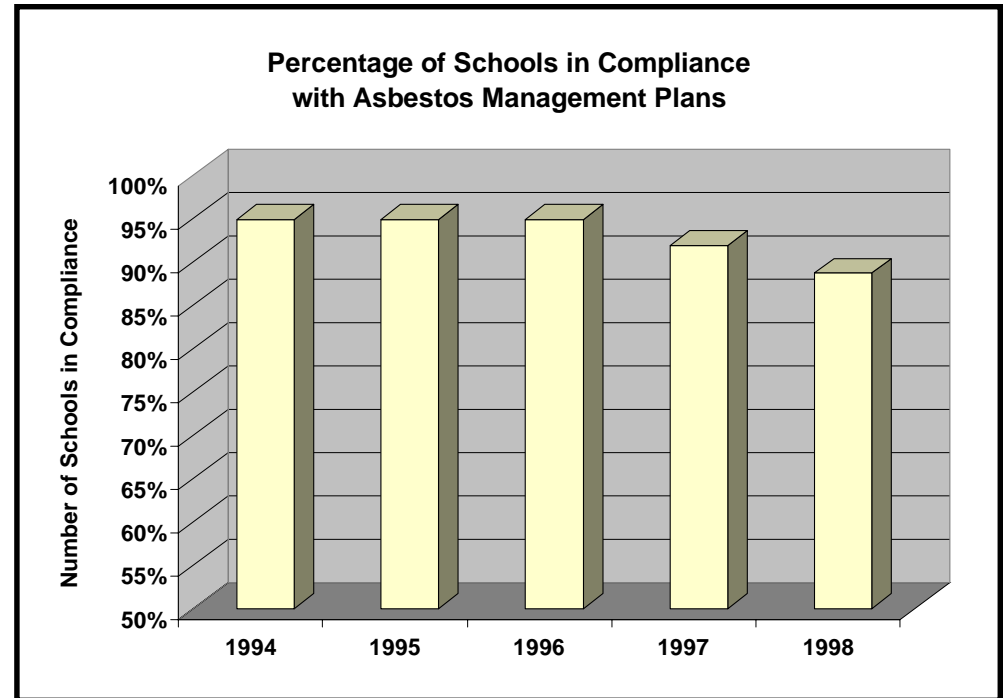


## Indoor Air Environments Section

of the Noise, Radiation & Indoor Air Quality Branch (NRIAQB)

### Percentage of Schools in Compliance with Asbestos Management Plan Regulations

Explanation: Asbestos-containing building materials (ACBMs) still exist in Hawaii's schools. Buildings constructed before 1980 contain asbestos in pipe insulation, structural fireproofing, mechanical areas, wall plasters, etc. If ACBMs are not properly identified and managed, they may be unintentionally disturbed, causing the release of asbestos fibers. EPA regulations require all schools to prepare an Asbestos Management Plan, which documents the presence and condition of ACBMs and specifies provisions for properly managing any such material present. Plans are required to contain inspection and re-inspection reports; periodic surveillance reports; response action information; notices sent to parents and employees; designated person information and custodian training documents. Since the program's inception in 1988, over 400 schools have been contacted by NRIAQB staff and informed of this requirement. For purposes of this measurement, compliance is assumed unless an inspection proves otherwise. Compliance peaked near 95% in 1994, and has since declined slightly to 89%. The number of schools required to comply changes as new schools open and existing schools close down.



**Asbestos Compliance Data**

FFY	Total Number of Schools Required to Comply	Number of Schools in Compliance	Percentage of Schools in Compliance
1994	414	393	95%
1995	414	393	95%
1996	414	393	95%
1997	419	385	92%
1998	389	345	89%

Implications: The chart shows a visual decline in compliance, which is likely due to increased inspections, which have revealed additional non-compliance. Nine out of 10 schools have asbestos management plans, but there is not necessarily a direct correlation between the existence of a plan and its implementation.

Data Quality: Medium (i.e.,  $\pm 10$ -25% confidence).

Source: Bobby Lopes (NRIAQB).

Data required from HDOH by EPA?: Yes.

## Percentage of Schools Participating in the Indoor Air Quality “Tools for Schools” Program

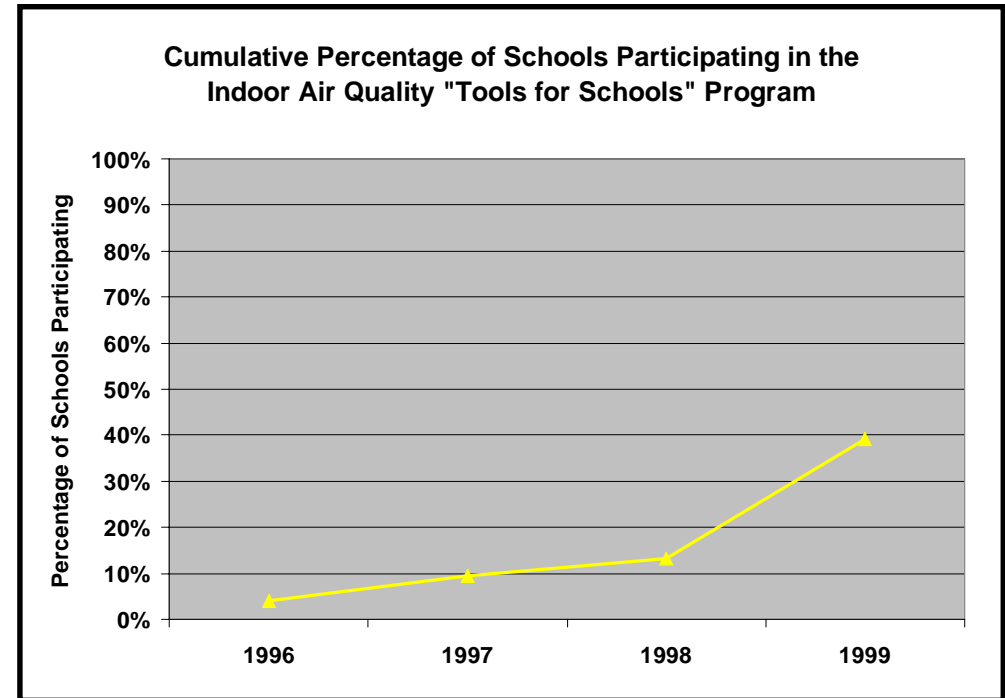
Explanation: In recent years, comparative risk studies conducted by the EPA and its Science Advisory Board have consistently ranked indoor air pollution among the top five environmental risks to public health. Based on those results, indoor air pollution was ranked the top risk to human health in Hawaii in the 1992 *Hawaii Environmental Risk Ranking* study. In 1994, responding to these studies, the Hawaii state legislature established an indoor air pollution program within HIDOH. EPA provides funding to HIDOH for its Indoor Air Quality program. One of the major elements of the EPA grant work plan is the promotion of the “Tools for Schools” program, through which ‘action kits’ are distributed to willing personnel of schools with grades from kindergarten through 12th grade. The effort, which began in 1996, has resulted in the distribution of information packets to 152 schools, or 40% of the target universe.

Implications: Noise, heat, humidity, mold & mildew, intrusive outdoor air pollutants, and lack of adequate ventilation are typical indoor air quality problems in schools. Such conditions may exacerbate illnesses among occupants, as well as impact the productivity of students and teachers.

Data Quality: Low (i.e.,  $\pm 25$ -50% confidence).

Source: Bobby Lopes (NRQAQB).

Data required from HIDOH by EPA?: Yes.

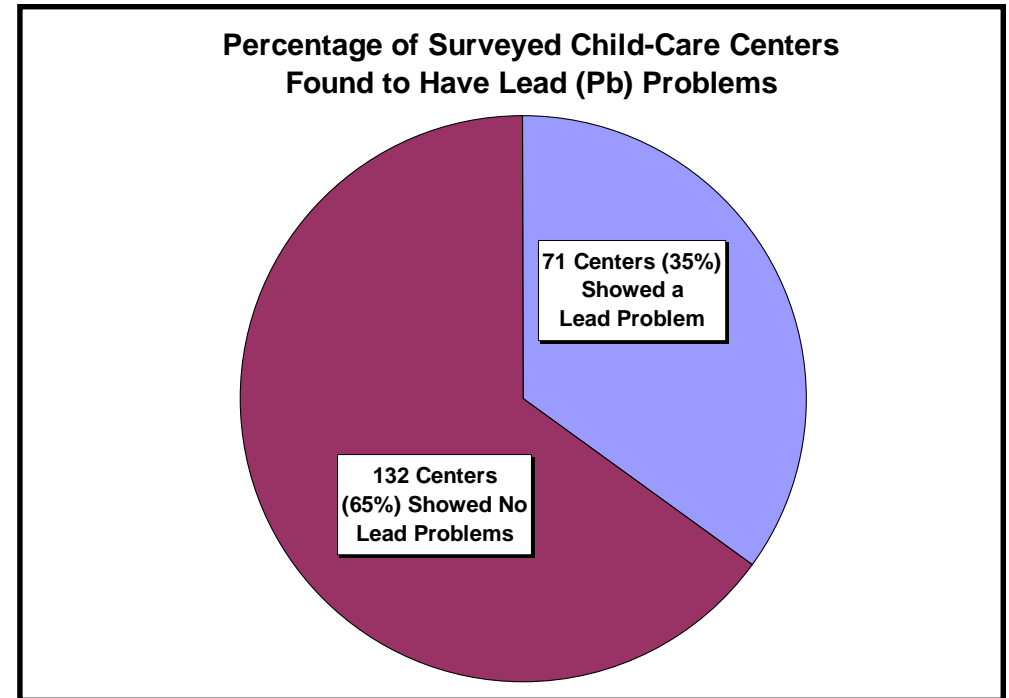


Tools for Schools Data			
FFY	Total Number of Candidate Schools	Number of Schools Participating	Percentage of Schools Participating
1996	419	17	4%
1997	413	39	9%
1998	389	51	13%
1999	389	152	39%

## Percentage of Surveyed Child Care Centers Indicating Lead (Pb) Problems

Explanation: Just under half of the known child care centers in Hawaii participated in a one-time lead (Pb) survey conducted by NRIAQB staff in 1997. Of those surveyed, approximately one-third of the centers tested positive for the existence of lead-based paint in areas accessible to children. Examples of 'problems' include whenever lead-based paint is: deteriorated, disturbed without proper controls, and disposed of improperly.

Implications: All centers which tested positive were informed of the results and assisted by NRIAQB staff in addressing the problem. They were not, however, required to report to HDOH regarding their attempts at remediation. Of broader interest is the assumed extension of the problem to those centers which where not surveyed. Because exposure to lead is known to impact the development of brain function in children, these results are cause for concern. While HDOH has no plans (nor authority) to require the remaining child-care centers to participate in this study, the state Department of Human Services, which licenses these centers, is considering requirements for lead-based paint inspections by facility owners.



Child Care Center Lead Survey Data

	Licensed Centers	Centers Participating	Centers with Lead Problem	Centers with No Lead Problem
Number of Centers	442	203	71	132
Percentage within Survey		100%	35%	65%

Data Quality: High (i.e.,  $\pm$ 5-10% confidence).

Source: Bobby Lopes (NRIAQB).

Data required from HDOH by EPA?: Yes.

# Solid & Hazardous Waste Branch Indicators

## Contaminated Sites with Clean-up Completed

Explanation: Progress made in the clean-up of contaminated sites, here broken down into three categories of sites, is measured by the completion of the clean-up process. Leaking underground storage tank (LUST) sites comprise the vast bulk of the clean-ups. The number of sites cleaned up in 1998 increased three-fold over each of the previous three years.

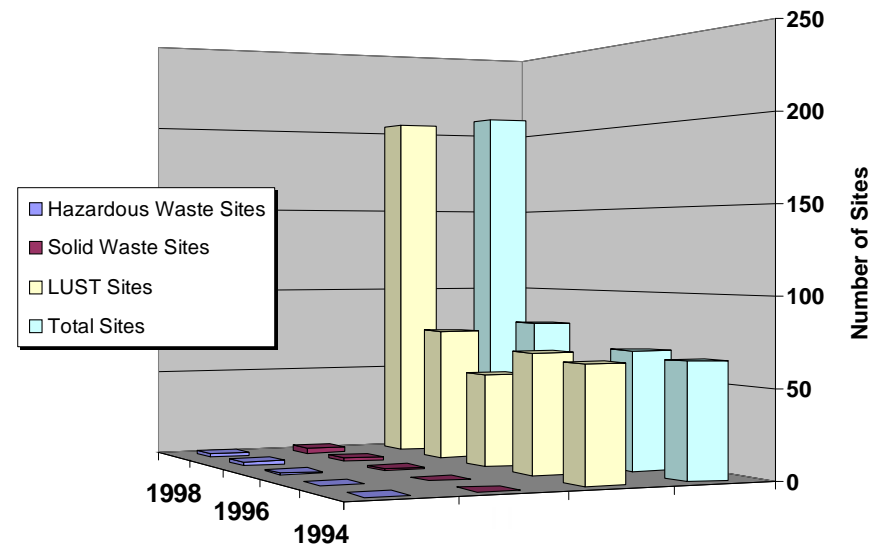
Implications: The number of LUST sites has increased significantly since December 1998, when new rules were put into effect which required many older tanks to be removed from the ground, at which time the leaks were discovered. The bad news, therefore, is that the contents of many tanks have leaked into the surrounding soil. The good news is that contamination is being addressed at an increased rate. HIDOH has previously published this indicator under the same title, except that only LUST sites were measured.

Data Quality: Medium (i.e.,  $\pm 10$ -25% confidence).

Sources: Grace Simmons (SHWB), Lane Otsu (OSWM), and Greg Olmsted (SHWB).

Data required from HIDOH by EPA?: Yes.

Contaminated Site Clean-Ups Completed Annually



Contaminated Sites Clean-up Data

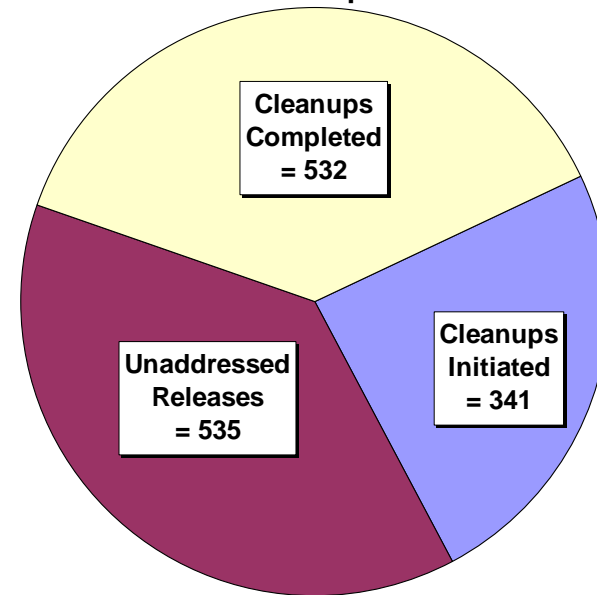
FFY	Hazardous Waste Sites	Solid Waste Sites	LUST Sites	Total Sites
1994	0	0	65	65
1995	0	0	68	68
1996	1	1	53	55
1997	2	2	76	80
1998	2	3	203	208

## Cumulative Percentage of Leaking Underground Storage Tank (LUST) Sites with Clean-Up Partially Addressed or Completed

Explanation: Of the 1408 confirmed releases from underground storage tanks from 1986 to 1998, almost two-thirds have had clean-up initiated and/or completed (i.e., efforts have begun which: manage contaminated soil, remove free product, manage dissolved petroleum, and/or monitor the groundwater or soil). Twenty-four percent of the sites have had clean up partially addressed, and 38% have been cleaned up. Another 38% have yet to be addressed.

Implications: Some of the data for this indicator are included with the data listed on the previous page; the data on this page pertains only to LUST sites and includes releases which have received no clean-up activity or which have only had clean-up partially address. Clean-ups for this category of “contaminated sites” has increased recently to match the increase in reported releases. Of the 38% of the sites which have not been addressed, many are recent releases for which the HIDOH has yet to receive information on their clean-up efforts. None of the unaddressed sites constitutes an emergency situation; all emergencies are addressed immediately by the emergency response personnel. (See “Implications” under the previous indicator for further discussion of LUST releases.)

Number of Leaking Underground Storage Tank Sites Cleaned Up as of 1998



LUST Site Clean-up Data

Total Tanks	Active Tanks	Closed Tanks	Confirmed Releases	Clean-ups Partially Addressed	Clean-ups Not Initiated	Clean-ups Completed
6,236	2,693	3,543	1,408	341	535	532

Data Quality: High (i.e.,  $\pm 5$ -10% confidence).

Source: Greg Olmsted (SHWB).

Data required from HIDOH by EPA?: Yes.



## Quantity of Hazardous Waste Generated in Hawaii

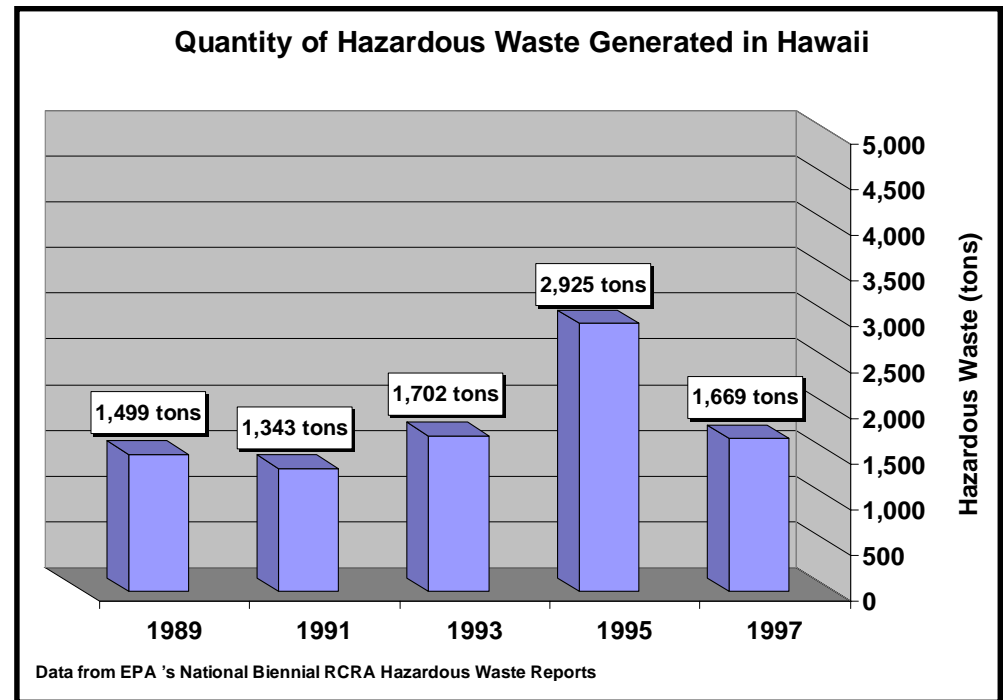
**Explanation:** Hazardous waste generation, as presented on this page, is reported by “large quantity generators” in odd years to EPA. “Small quantity generators” were included only in the data for 1995. Overall, the quantity of waste generated as shown in this indicator has ranged from roughly 1300 to 3000 tons annually during the period from 1987 through 1997. Waste generation in 1995 shows as a peak year because of the inclusion of small quantity generators in that years’ data (an initiative of the SHWB). Hazardous waste produced in the form of wastewater has been excluded from this indicator because data quality for wastewater quantities is particularly questionable and was removed as an EPA reporting requirement in 1997. Hazardous waste is defined in 40 CFR 261.3 as having any of the four hazardous characteristics (i.e., ignitability, corrosivity, reactivity, or toxicity), or being specifically listed as a substance to be regulated as a hazardous waste.

**Implications:** Hazardous waste generation has been relatively low in Hawaii compared to other states. During the 10 year period represented by this indicator, there appears to be a slight increase in hazardous waste generation.

**Data Quality:** Low (i.e.,  $\pm 25$ -50% confidence).

**Source:** Grace Simmons (SHWB).

**Data required from HDOH by EPA?:** Yes.



Hazardous Waste Generation Data

FFY	Hazardous Waste Generated, in Tons
1989	1,499
1991	1,343
1993	1,702
1995	2,925
1997	1,669

## Percentage of Solid Waste Recycled in Hawaii

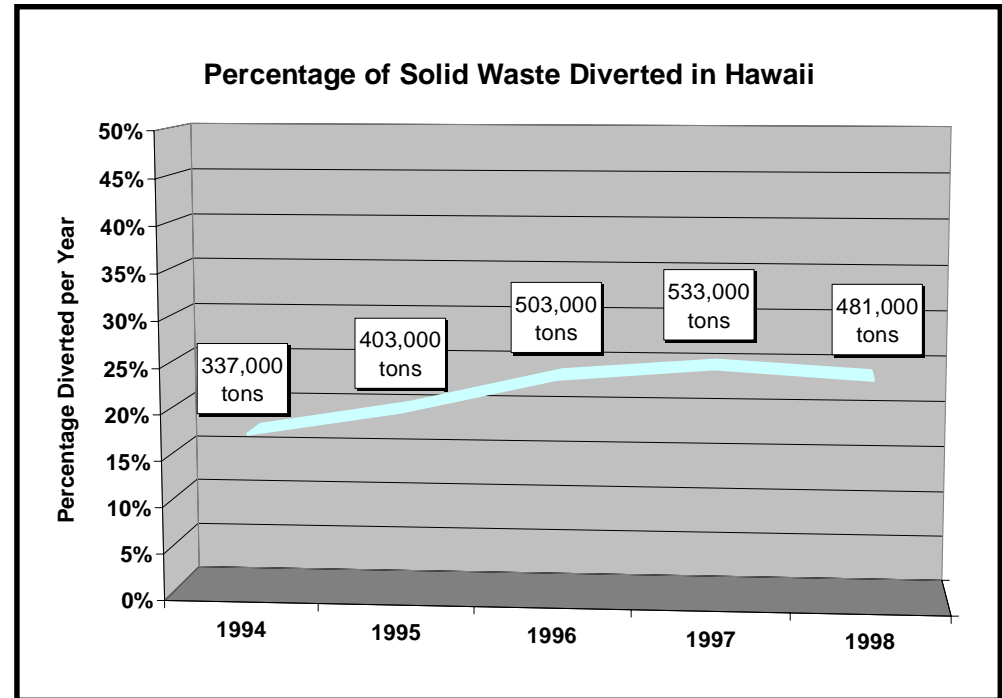
**Explanation:** The percentage of solid waste being diverted (for the purpose of recycling) in Hawaii is apparently slowly increasing, reaching 25% in recent years. The amount of solid waste produced each year has not risen significantly over that period. Amounts diverted do not include waste sent to H-Power for incineration and power generation.

**Implications:** Hawaii's legislated goal for solid waste recycling is 50% by the year 2000. Reaching that goal is more than unlikely, given the current trend and short time remaining. Because Hawaii does not have a large local market, most recycled goods must be shipped out for processing. These shipping costs make it difficult for Hawaii recycling businesses to compete, especially in a period when the market price for raw recycled materials is low.

**Data Quality:** 1994-96: Low (i.e.,  $\pm 25$ -50% confidence); 1997-98: Medium (i.e.,  $\pm 10$ -25% confidence).

**Source:** Lane Otsu (OSWM).

**Data required from HDOH by EPA?:** No.



**Solid Waste Recycling Data (in tons)**

FFY	Produced Statewide	Disposed Statewide	Diverted Statewide	Percentage Diverted
1994	1,953,000	1,616,000	337,000	17%
1995	2,023,000	1,620,000	403,000	20%
1996	2,122,000	1,619,000	503,000	24%
1997	2,132,000	1,599,000	533,000	25%
1998	2,004,000	1,524,000	481,000	24%

# Hazard Evaluation & Emergency Response Office Indicator

## Oil and Chemical Releases in Hawaii

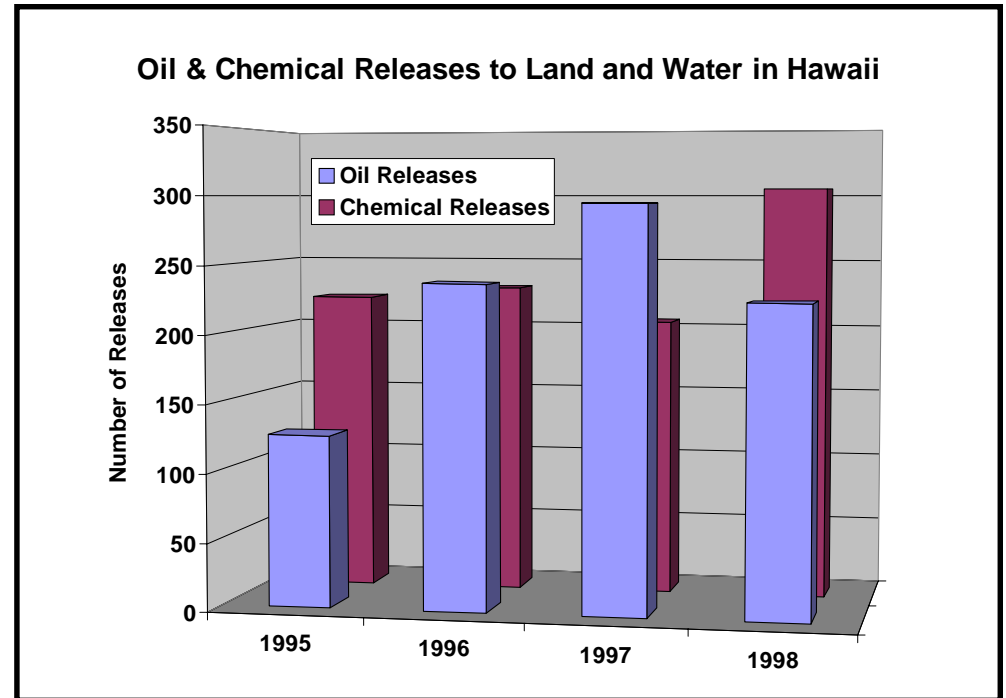
Explanation: The number of oil and chemical releases from 1995 to 1998 offer no clear trend. (Data for 1994 are not in the database.) The database currently contains only initial information regarding a release. Follow-up information on releases (including volumes of releases) is not included.

Implications: There are lots of ‘spills’ (roughly 400-500) each year to which the HEER office crews respond. A few are major, most are minor. Some are false alarms. An increase in the number of releases does not necessarily correlate with an increase in damage to the environment. Future tracking and reporting will include volumes of spills instead of number of spills.

Data Quality: Medium (i.e.,  $\pm 10$ -25% confidence).

Source: Marsha Graf (HEER).

Data required from HDOH by EPA?: No.



**Oil & Chemical Release Data**

FFY	Oil Releases	Chemical Releases
1995	126	222
1996	237	230
1997	295	205
1998	225	305

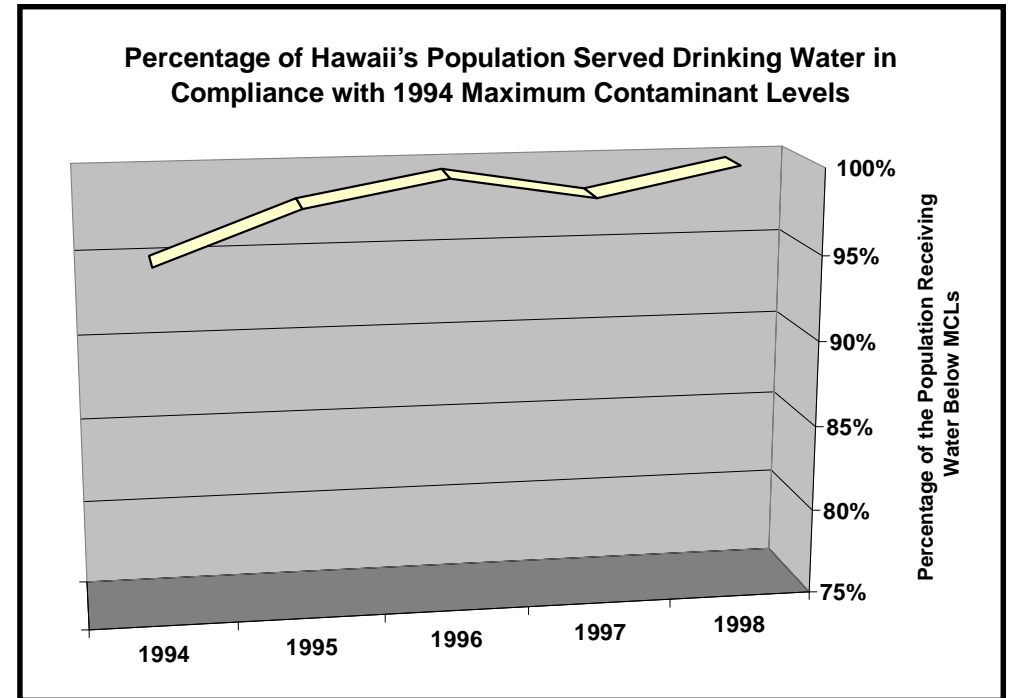
## Safe Drinking Water Branch Indicators

### Percentage of Hawaii's Population Served Drinking Water in Compliance with 1994 State and Federal Microbiological and Chemical Maximum Contaminant Levels (MCLs)

**Explanation:** Ninety-five to 99.8% of Hawaii's resident and visitor population receives water from public systems that distribute water which does not exceed microbiological or chemical standards, called maximum contaminant levels (MCLs). Population figures are derived by taking the sum of the populations each public system reports that it serves. Water which exceeds MCLs is believed to be harmful to human health. When a system has any single exceedance during the year, it is shown here as an exceedance for the whole year for the population served by that system. This indicator uses the 1994 standards in order to show trends based on a steady baseline. Measuring progress towards a moving target (i.e., changing MCLs) would make this indicator too complex.

**Implications:** The compliance rate of 99.8% for 1998 is quite high, and has been improving slightly in the last 5 years. On the other hand, even with a 99.8% compliance rate, the figures indicate that at some point in time, up to 27,000 (0.2 % of 1.3 million) people were possibly exposed to drinking water above MCLs. The systems with these violations are typically the smaller, private systems. Whenever a violation is found, recipients of the water are notified by hand-delivered and/or published notices.

**Data Quality:** High (i.e.,  $\pm$ 5-10% confidence).



Drinking Water MCL Compliance Data

FFY	Total Population Served Drinking Water	Population Served Water Below MCLs	Percentage Population Served Water Below MCLs
1994	1,343,548	1,276,400	95.0%
1995	1,343,538	1,317,301	98.0%
1996	1,347,266	1,341,126	99.5%
1997	1,334,397	1,310,573	98.2%
1998	1,333,717	1,331,353	99.8%

**Source:** Ann Zane (SDWB).

**Data required from HIDOH by EPA?:** Yes.

## Cumulative Number of Sanitary Surveys Conducted for Drinking Water Sources in Hawaii, 1997-1999

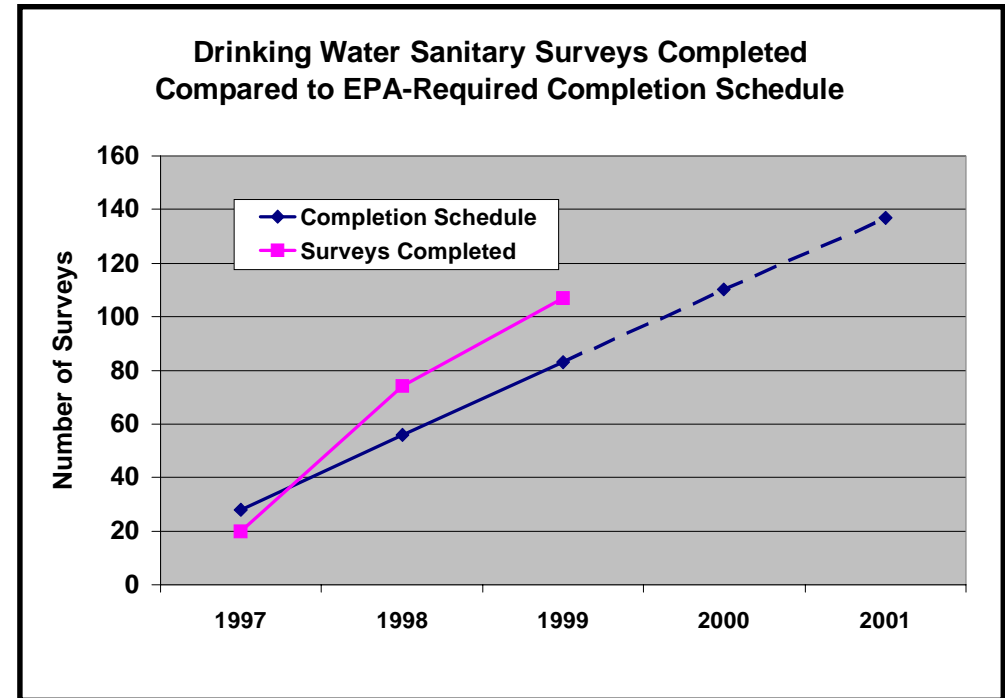
**Explanation:** A sanitary survey is a periodic review of the water source, facilities, equipment, operation and maintenance practices and records to verify that a public water system is operating properly. EPA requires HIDOH to conduct 'Sanitary Surveys' of all Public Water System treatment and distribution operations over a 5-year period. For Hawaii, that averages 27.4 surveys per year. The SDWB is ahead of that schedule, having completed 107 surveys out of the total of 137 required.

**Implications:** The last round of surveys was held from 1988-91, so it is a positive move for HIDOH to inspect these operations again. Within 30 days of each survey, the SDWB will submit a sanitary survey report to the purveyor discussing any deficiencies and recommendations. The SDWB also requests a response from the purveyor within 30 days of receiving the report. When problems are found during surveys, the risk of water contamination is assessed. If the problem poses an immediate risk of contamination to the source or finished water, the SDWB will direct the purveyor to correct the problem within 24 hours. In some cases, they request that the purveyors follow up with microbiological and chemical testing.

**Data Quality:** High (i.e.,  $\pm 5$ -10% confidence).

**Source:** Queenie Komori (SDWB).

**Data required from HIDOH by EPA?:** Yes.



Sanitary Survey Data		
FFY	Total Number of Systems to Survey	Surveys Completed Annually
1997	28	20
1998	28	54
1999	27	33
2000	27	
2001	27	



## Percentage of Underground Injection Wells in Compliance with State and Federal Regulations

Explanation: The percentage of underground injection well facilities in compliance with state and federal regulations (i.e., those with a current and valid permit) has declined to roughly 50% in the last four years, down from 60%. The majority of wells not considered compliant are drainage injection wells used for rainfall runoff disposal. Wells for sewage, commercial and industrial injection are given higher priority and have a higher compliance rate. Most drainage injection well facilities had valid permits at one time, but some of those permits have expired. Permit renewals for low priority facilities have not been aggressively pursued by HIDOH in favor of renewals and compliance for higher risk injection well facilities.

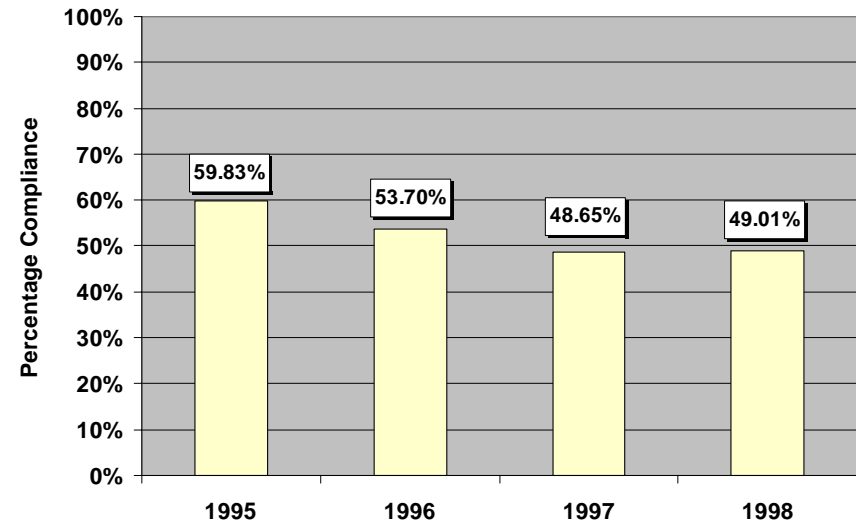
Implications: Drainage injection wells pose a relatively low potential for environmental contamination, as compared to industrial- or sewage-related facilities. However, for counting purposes, all facilities are weighed equally. In the future, it is anticipated that new regulations will provide for a permit-by-rule for drainage injection wells.

Data Quality: High (i.e.,  $\pm$ 5-10% confidence).

Source: Chauncey Hew (SDWB).

Data required from HIDOH by EPA?: Yes.

Percentage of Underground Injection Well Facilities in Compliance with State and Federal Regulations



Underground Injection Well Facility Compliance Data

FFY	Total UIC Permits	Total Expired Permits	Percentage Permits in Compliance
1995	478	192	59.8%
1996	473	219	53.7%
1997	483	248	48.7%
1998	504	257	49.0%

## Clean Water Branch Indicator

### Beach Closure Days Annually Due to Sewage or Chemical Releases

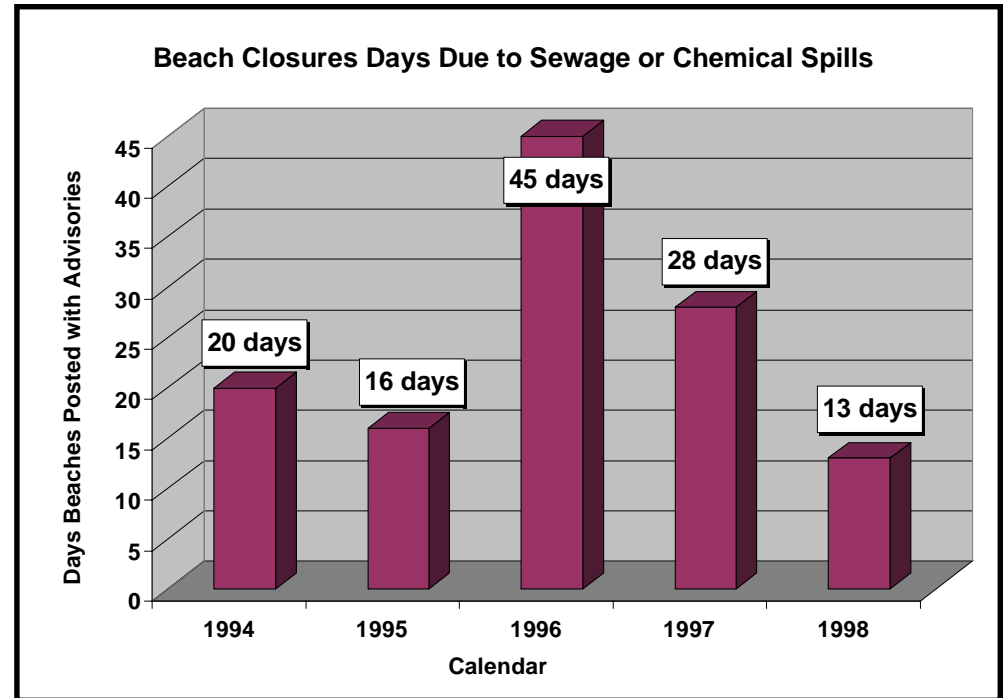
Explanation: This indicator reflects the number of days each year that DOH requires warning or closure signs to be posted at recreational coastal waters due to sewage or chemical spills. A visual trend in the chart points to an increase until 1996, and then a decrease in the subsequent 2 years. Overall, 1996 seems to be the worst year, with 45 beach closure days, depending on which data source is used.

Implications: In 1996, DOH published a goal of 5 beach closure days per year by the year 2000. Confoundingly, 1996 was a peak year in beach closures. Apparently, high levels of precipitation in 1996 influenced beach closures, due mainly to increased bypassing of wastewater by treatment plants during times of localized flooding.

Data Quality: Low (i.e.,  $\pm 25$ -50% confidence).

Source: Ann Teruya (CWB), Natural Resources Defense Council (NRDC) web site and the OEQC 1998 Annual Report.

Data required from HODOH by EPA?: Not required, but reported to EPA in HODOH's biennial 305(b) report.



Beach Closures Data

	Days beaches closed per year
1994	20
1995	16
1996	45
1997	28
1998	13

# Environmental Planning Office Indicator

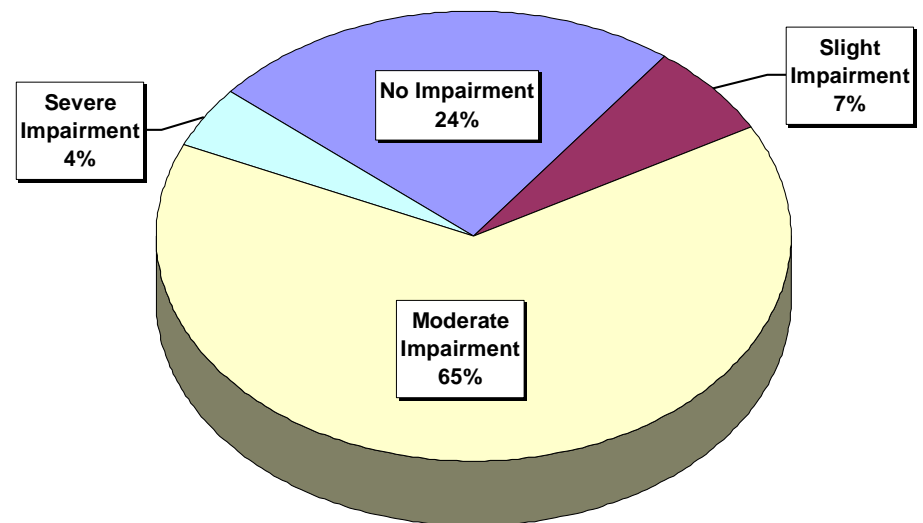
## Statewide Assessment of Stream Quality, 1997

**Explanation:** Throughout 1996 and 1997, EPA staff (assigned to EPO) conducted a stream quality assessment in Hawaii for the purposes of revising the list of Water Quality Limited Segments (WQLSs), as required by federal regulations. Of the 376 known perennial streams in Hawaii, 87 (23%) were surveyed to some extent. Short, easily accessible streams segments were assessed based upon visual indicators of stream impairment such as litter, excessive algae growth and excessive stream bank erosion. Water quality data were analyzed only for a few streams where data had been previously collected. Characteristics that were not measured include: support and propagation of native aquatic life, chemical pollutants, and habitat loss. Stream selection for assessment was largely based on public nomination on the presumption that the streams might be candidates for the WQLS list, so the survey was skewed towards finding negative results. Even so, 24% of those stream surveyed showed no impairment. Of the rest, two-thirds showed moderate impairment, 4% were severely impaired, and 7% were only slightly impaired. No trend data are available because HIDOH has collected too few years of data to assess stream quality on a systematic basis.

**Implications:** Because the selection of streams was skewed toward finding impaired streams, it can be assumed that these results, if applied broadly to the whole state, provide a worse-case scenario. Even so, it is alarming to see so many of Hawaii's streams are impaired in some way. EPO recommends improving our efforts to systematically survey Hawaii's streams on a permanent, rotating basis.

**Data Quality:** Medium (i.e.,  $\pm 10$ -25% confidence).

A Broad Assessment of Stream Quality



1996-97 Stream Survey Data

Level of Impairment	Number of Streams	Percentage of Streams
No Impairment	22	24%
Slight Impairment	6	7%
Moderate Impairment	59	65%
Severe Impairment	4	4%
Total Streams Surveyed	91	100%
Total Number of Perennial Streams	376	-

**Source:** State of Hawaii Clean Water Act 303(d) List for 1998.

**Data required from HIDOH by EPA?:** Yes.

# Wastewater Branch Indicators

## Percentage of Wastewater Recycled Annually

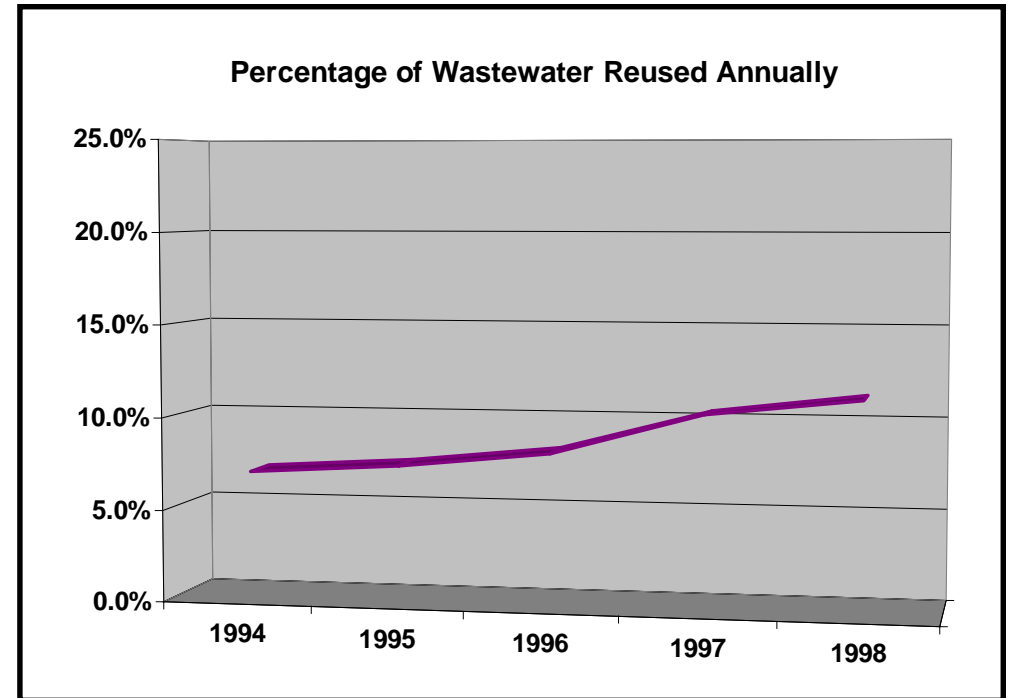
Explanation: Wastewater recycling (or reuse) has risen from 7% to 11% since 1994, according to the WWB data. Recent WWB figures show almost 17 million gallons per day (MGD) being reused. Data from the OEQC report shows lower treatment and reuse figures because it includes only county wastewater treatment systems.

Implications: HDOH had plans to encourage reuse to the extent that 25% of all wastewater would be recycled, but recent developments make that much less likely. Without cooperation from large plant owners (i.e., the counties and the military), large-scale reuse will not increase significantly.

Data Quality: Medium (i.e.,  $\pm 10$ -25% confidence).

Source: Tomas See (WWB) and 1998 OEQC Annual Report.

Data required from HDOH by EPA?: No.



Wastewater Reuse Data			
FFY	Total Wastewater Treated (MGD)	Wastewater Reused (MGD)	Percentage Reused
1994	151.6	10.5	6.9%
1995	150.1	11.1	7.4%
1996	150.1	12.3	8.2%
1997	150.0	15.6	10.4%
1998	150.0	17.0	11.3%

## Wastewater Treatment Plants Operation & Maintenance Compliance Records

**Explanation:** Roughly three-fourths of Hawaii's wastewater treatment plants show full compliance when inspected by WWB staff. This is a great improvement over 1990 through 1992, when compliance ranged from 55-60% (not shown by data on this page). Any O&M deficiencies, effluent violations or permit violations warrant an unsatisfactory rating.

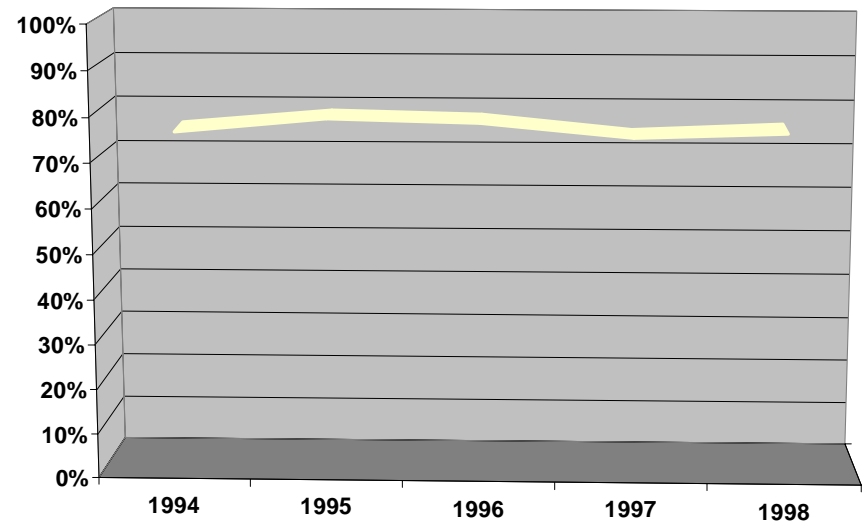
**Implications:** WWB staff believe O&M compliance leads to fewer sewage spills because equipment is well maintained and therefore breaks down less. Three-fourths compliance is better than 55% compliance, but WWB staff will be more than challenged to reach their stated goal of 95% compliance by the year 2000. A major cause of unsatisfactory ratings is due to the number of underground injection permits (which are covered by the O&M inspection) that have expired (see page 19 for a discussion of the underground injection permit program).

**Data Quality:** High (i.e.,  $\pm 5$ -10% confidence).

**Source:** Marshall Lum (WWB).

**Data required from HDOH by EPA?:** No.

**Percentage Operation & Maintenance Compliance of Wastewater Treatment Plants**



**Wastewater Treatment Plant O&M Data**

FFY	Number of Plants Inspected	Number of Plants Rated Unsatisfactory	Percent in Compliance
1994	135	33	76%
1995	163	35	79%
1996	103	23	78%
1997	176	45	74%
1998	169	41	76%